LUBRICATION ORDER
9 JAN 84

(Supersedes LO 5-3805-237-12 -1, JANUARY 1974; AND -12-2, AND -3, 1 MAY 1967)

GRADER, ROAD, MOTORIZED: DIESEL
ENGINE Driven; 13,300 LB PRESSURE AT
BLADE; 12 FT BLADE; 6 WHEELS, 4 DRIVING,
2 STEERABLE; LEANING FRONT WHEELS;
W/SCARIFIER (LETOURNEAU-WESTINGHOUSE
MODEL 440 HA) NSN 3805-00-931-7881

Reference: TM 5-3805-237-12, and FEDERAL SUPPLY CATALOG C9100-1L.

Intervals (on-condition or hard time) and the related man-hour times are based on normal operation. The man-hour time specified is the time you need to do all the services prescribed for a particular interval. On condition (OC) oil sample intervals shall be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hard time interval if your lubricants are contaminated or if you are operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The hard time interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hard time intervals will be applied in the event AOAP laboratory support is not available.

WARNING

Dry cleaning fluid is flammable. Do not use near a flame or excessive heat. Use only with adequate ventilation. Avoid prolonged breathing of vapors and minimize skin contact.

Clean parts or fittings with dry cleaning solvent (SD), Type II or equivalent. Dry before lubricating. Dotted arrow shafts indicate lubrication on both sides of equipment. A dotted circle indicates a drain below. Relubricate all items found contaminated after fording or washing.

The lowest level of maintenance authorized to lubricate a point is indicated by one of the following symbols as appropriate: Operator/Crew (C); and Organizational Maintenance (O).

Reporting errors and recommending improvements.

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, MI 48090. A reply will be furnished to you.

*The time specified is the time required to perform all services at the particular interval (on-condition or hard times).

<table>
<thead>
<tr>
<th>TOTAL MAN-HOURS</th>
<th>TOTAL MAN-HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERVAL MAN-HOURS</td>
<td>INTERVAL MAN-HOURS</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>1.6</td>
<td>.2</td>
</tr>
</tbody>
</table>

*The time specified is the time required to perform all services at the particular interval (on-condition or hard times).
LUBRICANT • INTERVAL

Steering Gear
(Lubricated by hydraulic oil)

Wheel Bearings (0)
(See Note 4)

Scarifier Lift Housing Fill Plug (0)
(See Key)

Scarifier Lift Housing Drain (0)
(See Note 5)

Scarifier Lift Housing Level (C)
(See Note 5)

Lift Housing (0)
(2 fittings)

Lift Housing Fill and Level Plug (C)
(See Key)

Lift Housing Drain (0)
(See Note 6)

Scarifier Control Shaft (O)

INTERVAL • LUBRICANT

Front Wheel Lean Housing Drain (C)
(See Key)

Front Wheel Lean Housing Fill Plug (0)
(See Key)

Front Wheel Lean Housing Drain (0)
(See Note 7)

Front Wheel Lean Control Shaft (0)
(2 fittings)

Lift Control Shaft (0)
(2 fittings)

Power Control Box Fill Plug (0)
(See Key)

Power Control Box Drain (0)
(See Note 7)

Power Control Box Level (C)
(See Note 7)
LUBRICANT • INTERVAL

Scarifier Gear Reducer Housing Fill Plug (O) (See Key)

Scarifier Gear Reducer Housing Drain (O) (Drain and refill) (See Note 5)

Scarifier Gear Reducer Level (C) (Check level)

Lift Gear Reducer Housing Fill Plug (O) (See Key)

Lift Gear Reducer Housing Drain (O) (Drain and refill) (See Note 6)

Lift Gear Reducer Housing Level (C) (Check level)

Lateral Shift Link (O) (2 fittings)

Axle Bearings (C) (2 fittings each side) (Sparingly)

FRONT END VIEW

INTERVAL • LUBRICANT

10 GAA Steering Control Shaft (O) (2 fittings)

10 GO Circle Flange (O) (See Note 16)

10 GAA Circle Reverse Control Shaft (O) (3 fittings)

GO Power Control Box Vertical Drive Housing Fill Plug (O) (See Key)

GO Power Control Box Vertical Drive Housing Drain (O) (Drain and refill) (See Note 9)

Power Control Box Vertical Drive Housing Level (C) (Check level)
LUBRICANT • INTERVAL

Master Cylinder Fill
and Level (C)
(See Key)
(Check level)

Clutch Bearings (O)
(2 fittings)
(Sparingly)

Engine Oil Level
Gage (C)
(See Note 12)

Engine Crankcase
Fill (C)
(See Key)

Axle Bearings (O)
(2 fittings each side)
(Sparingly)

Engine Oil Filter (O)
(Change Element)
(See Note 13)

INTERVAL • LUBRICANT

BFS 10

Clutch Bearings (O)
(2 fittings)
(Sparingly)

GAA 50

GAA 10

GAA 10

GAA 250

GAA 50

OE/ HDO

OE/ HDO

GAA 50

GAA 10

1000

GAA 10

GAA 50

10

100

100

REAR END VIEW

GAA

Engine Oil
Drain (O)
(Drain and refill)
(See Note 15)

OC or

OC or

OE/ HDO

Tandem Drive
Fill (C)
(See Key)

Tandem Drive
Level (C)
(Check level)

Tandem Drive
Drain (O)
(Drain and refill)
(See Note 14)

Outboard and Inboard Bearings (O)
(Sparingly)

Brake Linkage (O)
(5 fittings)

Throttle Linkage (O)
(6 fittings)

Drive Shaft Spline Joints (O)

Engine Oil Level
Gage (C)
(Check level)
(See Note 12)
### Expected Temperatures

<table>
<thead>
<tr>
<th>LUBRICANTS</th>
<th>CAPACITY</th>
<th>Above +15°F (Above -9°C)</th>
<th>+40°F to -15°F (+4°C to -26°C)</th>
<th>+40°F to -65°F (+4°C to -54°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OE/ - Lubricating</td>
<td></td>
<td>OE/HDO 30</td>
<td>OE/HDO 10</td>
<td></td>
</tr>
<tr>
<td>HDO - Internal Combustion Engine, Tactical Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEA - Lubricating Oil, Internal Combustion, Arctic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Can Points (See Note 3)</td>
<td></td>
<td>17 qts (16 L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine Crankcase</td>
<td></td>
<td>3 qts (2.83 L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Control Box</td>
<td></td>
<td>26 qts. ea (24.60 L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tandem Drives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Hydraulic Tank</td>
<td></td>
<td>16 qts. (13.3 L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GO - Lubricating Oil, Gear Multipurpose</td>
<td></td>
<td></td>
<td>GO 85W/140</td>
<td></td>
</tr>
<tr>
<td>Circle Reverse Housing</td>
<td></td>
<td>2 qts (2.89 L)</td>
<td></td>
<td>TANK 16 qts. (13.3 L)</td>
</tr>
<tr>
<td>Circle Reverse Transfer Housing</td>
<td></td>
<td>3/8 qt. (0.35 L)</td>
<td></td>
<td>TANK 1/2 qts. (0.71 L)</td>
</tr>
<tr>
<td>Circle Reverse Transfer Housing</td>
<td></td>
<td>1-1/2 qts. (1.22 L)</td>
<td></td>
<td>TANK 1 qts. (0.946 L)</td>
</tr>
<tr>
<td>Circle Front Wheel Lean Housing</td>
<td></td>
<td>8 qts. (7.07 L)</td>
<td></td>
<td>TANK 1-1/2 qts. (1.22 L)</td>
</tr>
<tr>
<td>Circle Lateral Shift Housing</td>
<td></td>
<td>1 qt. (0.946 L)</td>
<td></td>
<td>TANK 1-1/2 qts. (1.22 L)</td>
</tr>
<tr>
<td>Circle Lift Gear Reduction Housing</td>
<td></td>
<td>1/2 qt. (0.47 L)</td>
<td></td>
<td>TANK 1-1/2 qts. (1.22 L)</td>
</tr>
<tr>
<td>Circle Scarifier Gear Reduction Housing</td>
<td></td>
<td></td>
<td></td>
<td>TANK 1-1/2 qts. (1.22 L)</td>
</tr>
</tbody>
</table>

*See Note 17 for lubricant specification number.

**KEY**

- **C/MR** - Condition Monitor
- **OC** - On Condition (AOAP)

For Arctic operation refer to FM 9-207

Intervals given are in hours of normal operation.
**Expected Temperatures**

<table>
<thead>
<tr>
<th>LUBRICANTS</th>
<th>CAPACITY</th>
<th>EXPECTED TEMPERATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>OE/ - Lubricating Oil, Gear Multipurpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Scarifier Lift Housing</td>
<td>12-1/2 qts. (11.83 L)</td>
<td>GO 85W/140</td>
</tr>
<tr>
<td>- Power Box Vertical Drive Shaft Housing</td>
<td>4 qts (3.78 L)</td>
<td>GO 80W/90</td>
</tr>
<tr>
<td>- Upper Transmission</td>
<td>11 qts. (10.40 L)</td>
<td>GO 75W</td>
</tr>
<tr>
<td>- Lower Transmission</td>
<td>50 qts. (47.73 L)</td>
<td></td>
</tr>
<tr>
<td>BFS - Brake, Fluid Silicone Automotive</td>
<td></td>
<td>ALL TEMPERATURES</td>
</tr>
<tr>
<td>- Master Cylinder</td>
<td>1-1/4 QTS. (1.18 L)</td>
<td></td>
</tr>
<tr>
<td>GAA - Grease Automotive and Artillery</td>
<td></td>
<td>ALL TEMPERATURES</td>
</tr>
</tbody>
</table>

**Intervals**

- C/MR - Condition Monitor
- OC - On Condition (AOAP)
- Intervals given are in hours of normal operation.

*See Note 7 for lubricant specification number.

**Notes:**

1. **Army Oil Analysis Program (AOAP).** For Active Army units, obtain samples from engine every 50 hours of operation or 60 days (whichever comes first). Reserve and National Guard activities will use 50 hours or 120 days as the prescribed sample intervals. Reserve and National Guard equipment in frequent use during active training period will adhere to the schedule for Active Army units. As a minimum, one sample from each unit's two week active training period will be submitted for each item of equipment. Send these samples to the nearest AOAP laboratory. Refer to TB 43-0210 for sampling instructions. When or if AOAP laboratory support is unavailable, hard time intervals will apply.

2. **For Operation of Equipment in Protracted Cold Temperatures Below -15°F (-26°C).** Remove lubricants prescribed in Key for temperatures above -15°F (-26°C). Relubricate with lubricants specified in Key for temperatures below -15°F (-26°C). If OEA lubricant is required.

**NOTE**

- Do not hold oil samples. Submit oil samples as soon as they have been taken.
- Seasonal oil changes will be made due to expected temperatures. (See Key.)

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NOTES - CONTINUED:

to meet the temperature ranges prescribed in the Key, OEA lubricant is to be used in place of OE/HDO-10 lubricant for all temperature ranges where OE/HDO-10 is specified in the Key.

3. OIL CAN POINTS. Each 50 hours lubricate control linkage, pins and clevises, and all exposed adjusting threads with EO/HDO.

4. WHEEL BEARINGS. Each 1000 hours remove, clean, inspect, lubricate and assemble.

5. SCARIFIER LIFT HOUSING/SCARIFIER GEAR REDUCTION HOUSING. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water, or other foreign material. After refill, operate for 5 minutes, check for leaks and bring oil level to fill plug opening.

6. LIFT HOUSING/LIFT GEAR REDUCTION HOUSING. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water, or other foreign material. After refill, operate for 5 minutes, check for leaks and bring oil level to fill plug opening.

7. FRONT WHEEL LEAN HOUSING. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water, or other foreign material. After refill, operate for five minutes, check for leaks and bring oil level to fill plug opening.

8. CIRCLE REVERSE HOUSING/CIRCLE REVERSE TRANSFER HOUSING. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water, or other foreign material. After refill, operate for five minutes, check for leaks and bring oil level to fill plug opening.

9. LATERAL SHIFT HOUSING/POWER CONTROL BOX VERTICAL DRIVE HOUSING. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water, or other foreign material. After refill, operate for 5 minutes, check for leaks and bring oil level to fill plug opening.

10. HYDRAULIC OIL FILTER. Each 500 hours, remove element, clean filter housing and install new element. After replacement, operate hydraulic system for 5 minutes, check for leaks, check level and bring to "FULL” mark.

11. LOWER TRANSMISSION/UPPER TRANSMISSION AND SHIFTER HOUSING. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water, or other foreign material. After refill, operate for 5 minutes, check for leaks and bring oil level to fill plug opening.

12. ENGINE OIL LEVEL HOT OR COLD CHECK. Cold engine, oil level should be at high mark on dipstick. Hot engine, oil level must be between high and low marks on dipstick (allow to set 5 minutes before checking).

13. ENGINE OIL FILTER. Filter is to be replaced each time an engine oil change is directed by AOAP laboratory. After installing new filter element, fill crankcase, operate engine 5 minutes, check housing for leaks, check crankcase oil level and bring to full mark. When AOAP laboratory support is not available, install new filter element each 100 hours.

14. TANDEM DRIVES. Each 1000 hours drain tandems. Place tandems in uphill position and remove tandem level and drain plug.

15. ENGINE. Oil is to be changed each time an engine oil change is directed by

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NOTES - CONTINUED:

AOAP laboratory. When AOAP laboratory support is not available, change oil each 100 hours.

16. CIRCLE FLANGE. Clean circle flange with a solution of OE/HDO and Diesel Fuel, mixed one quart (0.946 L) OE/HDO to one gallon (3.78 L) of Diesel Fuel. After cleaning, wipe dry and apply a light coat of GO with a clean rag or shop towel.

17. LUBRICANTS. The following is a list of lubricants with military symbols and applicable specification numbers.

<table>
<thead>
<tr>
<th>Lubricant</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>OE/HDO</td>
<td>MIL-L-2104</td>
</tr>
<tr>
<td>GO</td>
<td>MIL-L-2105</td>
</tr>
<tr>
<td>GAA</td>
<td>MIL-G-10924</td>
</tr>
<tr>
<td>OEA</td>
<td>MIL-L-46167</td>
</tr>
<tr>
<td>BFS</td>
<td>MIL-B-46176</td>
</tr>
<tr>
<td>(SD), Type II</td>
<td>P-D-680</td>
</tr>
</tbody>
</table>

Copy of this Lubrication Order will remain with the equipment at all times, instructions contained herein are mandatory.

By order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

OFFICIAL:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

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